XX. *Some Observations on the Genus Andræa; with Descriptions of four British Species. By William Jackson Hooker, Esq., F.L.S.*

Read May 1, 1810.

The genus upon which it is my intention here to offer a few observations, was originally established by Ehrhart in the first number of his *Beiträge*, and there received the name it has always subsequently borne, in honour of his friend J. G. R. Andreæ, an apothecary and able naturalist at Hanover. The only species with which Ehrhart was acquainted was the *A. alpina*, a plant that had long been known among botanists, but had always previously been joined to the *Jungermanniæ*, between which and the *Musci calyptrati* it unquestionably forms the connecting link; so that, though amid all the various changes and improvements which have of late years taken place in the system of Mosses, the genus *Andræa* has had the peculiar good fortune of remaining unaltered, yet a question has always arisen, how far it properly belonged to the order of *Mosses*, or *Hepaticæ*; its habit being almost equally intermediate between both, and its capsule seeming to partake more of the nature of the latter than of the former. I shall briefly notice what has been done by those botanists who have made any alteration in the character of the genus, or in its place in the systematic order; and then proceed to a description of the parts of fructification; from which I trust,

that though, as remarked above, its appearance seems rather to assign it a place with the *Hepaticæ*, there will nevertheless be found no difficulty to exist in allowing it to continue, as it now generally stands, among the *Musci*.

The genus by Ehrhart himself was placed in the third order of the 24th class of Linnæus (the *Algæ*), which at that time contained what are now called *Hepaticæ*. He was, in all probability, induced to leave it there, from a reluctance to make alterations that did not appear absolutely necessary, and from its affinity to the genus *Jungermannia* in the same order, without considering the character of this order as given by Linnæus :— "A plant whose root and stem-leaves are all in one." It is however extraordinary he should have done so, since the definition of the genus *Andræa*, as first drawn out by himself, has so many characters in common with the *Musci*, and so few that are analogous to any thing among the *Algæ*.

For the benefit of those who may not have an opportunity of seeing the *Beiträge*, where it is contained, I will here transcribe this definition.

"ANDREÆA.

"*Perichætium* squamosum.
"*Squamæ* lanceolatæ, carinatæ, imbricatæ.
"*Anthophorum* longitudine perichætii.
"*Calyptra* conica, brevissima.
"*Stylopodium* nullum.
"*Conioecium* oblongum, subtetragonum, 4-sulcatum.
"*Apophysis* turbinata.
"*Valvulæ* quatuor carinatæ, angulares, basi apophysi apicibus conjunctorio adnatæ.

"*Suturæ*

" *Suturæ* laterales, ex medio sursum deorsumque versus dehiscentes.
" *Conjunctorium* obtusiusculum.
" *Dissepimentum* nullum.
" *Styliscus* cylindricus.
" *Spora* subtilissima."

With the above definition of *Andræa* before him, it is a matter of surprise that Hedwig, in the *Species Muscorum*, should have altered the characters to

" *Capsula* exigua, minuta. *Perist.* dentibus quatuor concavis, apice connexis, operculigeris :"

thus mistaking the apophysis for a capsule, and the four valves of the capsule for the teeth of a peristomium. He has, however, rightly arranged it among the *Musci*.

Bridel must have been entirely unacquainted with *Andræa*; or, surely, after having entered so deeply into the physiology of Mosses as he has done in the first volume of his *Muscologia*, he would have admitted the genus into that work. Had he once examined the fructification of *Andræa*, he would immediately have discovered that the characters of the order, to which it properly belongs, are accurately described in the chapter of his work entitled "*Quid sit Muscus*."

Dr. Roth comes next to be noticed, who, in the third volume of his *Flora Germanica*, has given a very full account of the genus, but has placed it among the *Hepaticæ*, on account of the capsule's opening into four valves. In order to do this, however, he supports an opinion that the *conjunctorium* of Ehrhart is not an operculum, and that it does not perform the office of that part of a moss. But, till we are more fully acquainted with the use of the operculum, and till we are certain that the *conjunctorium* of

Ehrhart has a different function assigned to it, surely it would be better to retain the old name of *operculum*, to which it has full as much right as the part which occupies the same place in *Phascum*, and even more so; for in *Andræa* it is sometimes of a different colour, and is always of a different texture, from the capsule. Dr. Roth doubts whether the seeds may not, while in the capsule, be fixed to filaments of a similar nature to those of the *Jungermanniæ*; but, in all the species I have had an opportunity of examining, I have not been able to observe any thing of the kind.

Thus was *Andræa* removed from one order to another, as if its parts of fructification were among the minutest of the vegetable kingdom, or among the most difficult to examine, till the late Dr. Mohr in his *Flora Germanica*, (of which he sent an unedited copy to his friend Mr. Turner a little before his death,) by a concise definition of the two orders *Musci* and *Hepaticæ*, satisfactorily established it as belonging to the former of these, which he calls "*operculatæ*,"* but he has still persisted in calling the valves of the capsule a peristomium.

Having thus delivered my opinion as to the order to which *Andræa* properly belongs, it remains for me to say a few words upon the place which in that order it ought to occupy; and here I trust no doubt can be entertained of the propriety of placing

* Dr. Mohr's 6th order of the class Cryptogamia, which he calls "*Calyptratæ*," is divided into

a. Operculatæ, containing all the true *Musci*, among which *Andræa* stands the last;

b. Deoperculatæ, which includes all the *Hepaticæ*.

However excellent the definitions of these subdivisions may be, it seems hardly necessary to alter the old terms of *Musci* and *Hepaticæ*. See Dr. Smith's *Flora Britannica*, 1099, 1101.

it

it the last; by which means its affinity to *Jungermannia*, with which the next order *Hepaticæ* begins, will be pointed out. Yet it is to be regretted that, by so doing, according to the present arrangement of *Musci*, it must be so widely separated from the genus *Sphagnum*, to which in many particulars it bears a most striking resemblance, and in none more so than in the white succulent *pedicellus** and irregularly torn *calyptra*, a part of which frequently remains at the base of the capsule. If it were necessary in an artificial arrangement to regard more particularly natural affinity, perhaps at some future time it would be found desirable to alter the present disposition of the genera of Mosses, and begin with those whose peristomium is of a more complicated structure,—for example, with *Buxbaumia*, which, according to Dr. Mohr, has a treble row of teeth,—and thus descend successively through *Hypnum*, and those with a double and single peristomium, to *Gymnostomum*, *Phascum*, *Sphagnum* and *Andræa*.

The most striking similarity between the latter genus and *Jungermannia* is in the fleshy or rather succulent peduncle, the deep brown colour of the capsule, and the circumstance of its opening into four valves; to these may be added the absence of an internal membrane to the capsule, and the irregularly torn calyptra, which is not cut round transversely (*circumscissa*) as in most of the Mosses. But if we examine more attentively the structure of the capsule of *Andræa*, a nearer approach to the true *Musci* may be readily discovered, and we shall not fail to meet with all the important characters of that order. Bridel in his *Muscologia*, i. *p.* 3, defines a moss to be "Planta fructu calyptrato

* I have called this a *pedicellus* in compliance with the generality of Muscologists; but it is in reality an elongation of the receptacle in *Andræa* as well as in *Sphagnum*; so that these two genera differ from all other Mosses in having the capsule really sessile.

et

et operculato prædita. Per fructum calyptratum, capsulam tegmento cucullato seu mitriformi corollæ speciem sistente, et a thalamo, cui primus adhærebat, divulso vel per medium abruptum * instructum intelligimus, et per fructum operculatum, capsulam operculo plerumque libero, et maturitate decidente, rariùs remanente, tectam." Thus, he continues, we remove from the order *Musci*, 1. the *Lycopodia*, 2. *Porella*, 3. *Marchantia*, *Jungermannia*, and *Anthoceros*, "quæ quidem fructu non vero operculato sed dentibus aut valvulis pluribus dehiscente gaudent." The capsule is in reality furnished with an operculum, that is to say, is terminated by a conical-shaped covering, which, although closely united to the capsule, still has its line of separation so far defined that I should not think any one would hesitate in calling it an operculum. In *A. rupestris* and *Rothii* this part is even of a different colour. It is true it does not fall off, as in most other Mosses, for the emission of the seeds, nor does the singular conformation of the capsule require it; for, when the capsule is fully ripe, four longitudinal openings permit the discharge of the seeds. This operation can only be performed in dry weather, when the spaces between the valves open, the valves themselves swelling out, and the capsule, from an ovato-oblong figure, becoming more orbicular, as represented at Tab. XXXI. *fig.* 4. f. In moist weather the openings become contracted, and the capsule recovers its original form, even though the seeds may have been discharged. The calyptra is never elevated with the capsule in the shape of a true calyptra, as in the *Musci* in general, nor does it open vertically as in *Jungermannia*, but is some-

* In a note to this passage, Bridel instances as a single exception the genus *Sphagnum*, in which the lower and torn part of the calyptra remains surrounding the base of the capsule. *Andræa* of course makes another exception.

what

what transversely and irregularly torn below the summit, in such a manner that a portion of it very frequently, if not always, adheres to the operculum, and remains there till the capsule begins to decay. In a young state it is tipped with a long hollow style, which soon falls off, and only a short mucro is seen to remain in a more advanced state. The internal part of the capsule is entirely filled with minute, brown, spherical seeds, except what is occupied by the columella, which is at first succulent and vasculose, but soon becomes dry and shrivelled.

Character Essentialis.

Capsula quadrivalvis, valvarum apicibus operculo adnato.

Character Naturalis.

Fruct. fœm. terminalis statu juniore foliis perichætialibus omninò obtecta.

Pistilla numerosa, minuta, oblonga, viridia, quorum unum solum maturescit, reliqua pedicelli ad basin restant.

Pedicellus vix lineam vel sesquilineam longitudine superans, foliis perichætialibus paulùm longior, albus, succulentus, vasculosus, cylindraceus, ad basin in bulbilli formam intumescens.

Apophysis oblonga vel turbinata, fusca, substantiâ pulposâ impleta.

Capsula ovata, intensè fusca, cylindracea, demum subquadrangularis, in quatuor valvas æquales longitudinaliter dehiscens, apicibus semper operculo connexis.

Columella capsulæ ferè longitudine, oblonga, cylindracea, pallidè fusca, apice subacuminata.

Semina numerosa, minuta, fusca, adamussim sphærica.

Operculum minutum, conicum, capsulæ concolor in *A. alpinâ* et *nivali*,

nivali, in *rupestri* et *Rothii* albescens, valvarum extremitati semper cohærens.

Calyptra membranacea, pellucens, albida, capsulam obtegens, demum, ut capsula evadat, enormiter et subhorizontaliter dehiscens.

Stylus longiusculus, fuscescens.

Fruct. mas. gemmiformis, terminalis.

Antheræ 3—7, ovato-subcylindraceæ, pallidè fusco-cinereæ, subpedicellatæ.

Fila succulenta numerosa, antheris multò longiora, filiformia, sursum versus modo parum incrassata, flavicantia, articulata, articulis longitudine diametrum subæquantibus.

* *foliis enervibus.*

1. Andræa *alpina.*

Andræa, caule ramoso, foliis oblongo-spathulatis apiculatis enervibus concavis undique imbricatis; perichætialibus oblongis acutis; interioribus circa pedicellum circumvolutis.

Jungermannia alpina. *Linn. Sp. Plant.* ii. *p.* 1601. *n.* 23. *Schrader, Spic. Fl. Germ. pars* 1*ma. p.* 76. *Weber, Spic. Fl. Goet. p.* 152. *n.* 216. *Fl. Dan. tab.* 1002. *f.* 1. *Roth, Fl. Germ.* 1. *p.* 485. *n.* 30.

Andræa petrophila. *Ehrhart, Beiträge* 1. *p.* 15. 192. *Hoffman, Deutschlands Flora* ii. *p.* 80. *Schrader, Syst. Samml. p.* 3. *n.* 91.

Andræa alpina. *Hedw. Sp. Musc. p.* 49. *Musc. Hib. p.* 13. *Smith, Fl. Brit.* iii. *p.* 1179. (excl. syn. A. rupestris Hedw.) *Roth, Fl. Germ.* iii. *p.* 359. *Engl. Bot. tab.* 1278. *Mohr, Fl. Crypt. Germ. p.* 383. *t.* 11. *f.* 3, 4.

Lichenastrum

Lichenastrum alpinum atro-rubens teres, calycibus squamosis. *Dill. Hist. Musc. p.* 506. *t.* 73. *n.* 39.

β *flavicans;* caulibus elongatis filiformibus, foliis laxè imbricatis flavicantibus.

γ *compacta;* caulibus densè pulvinatis strictissimis, foliis arctè imbricatis.

Hab. In palustribus montis Cader Idris, summitatem versus. In cautibus humidis, æquè ac siccis, montis Snowdon et ubique circa Llanberries. *Dillenius.* Ireland. *Mr. Turner.* On the summits of the Highland mountains, not uncommon.

β and γ on Ben Nevis.

Perennis. Æstate.

Caules cæspitosi, flexuosè erecti, unciales et ultrà, ramosi, ramis subsimplicibus, appressis, fastigiatis, ubique obsiti foliis laxè undique imbricatis, erecto-patentibus, obovatis, vel potius e basi oblongâ spathulatis, apice rotundatis, et mucrone perbrevi apiculatis, concavis, omnino enervibus, atro-rubescentibus ut oculo inermi nigra videantur, sub microscopio tamen flavicantibus, per totam substantiam longitudinaliter minutissimè punctato-striatis; *Perichætialia* ovato-oblonga, acutiuscula, circa pedicellum arctè imbricata, interiora circa ejus basin convoluta, exteriora erecta et concava, omnia colore substantiâque caulinorum similia; *Perigonialia* abbreviata, ovato-subrotunda, acuminata, concava.

Fructificatio; fœminea terminalis; *Pedicellus* sesquilinearis, foliis perichætialibus ferè obtectus, tener, albus, succulentus, demum brunneus, coriaceus, *Apophysi* coronatus, exiguâ, globosâ, fuscâ, capsulâ angustiore; *Capsula* oblongo-ovata, atro-fusca, in quatuor valvas æquales, angustas, apice cohærentes, longitudinalitèr fissa; *Operculum* valvarum apicibus adnatum, conicum, minutum, fuscum: *Mascula* gemmiformis, ramorum brevium latera-

lium ad apices terminalis; *Antheræ* 3—5 subpedicellatæ ovato-cylindraceæ, pallidè fuscæ; *Fila succulenta* antheris plus duplo longiora, numerosa, flavescentia, filiformia, sursum versus parùm incrassata, articulata, articulis longitudine diametrum subæquantibus.

Var. β major quam α, triuncialis et ultra, foliis laxiùs imbricatis magisque flavescentibus; caulibus simpliciusculis, filiformibus, tenuibus, flexuosis.

Var. γ caules habet densissimè pulvinatim compactos, ramis strictis, æqualibus, insignitèr fastigiatis; foliis arctè imbricatis, patentibus, quibus ab antecedentibus duabus varietatibus præcipuè differt:—foliorum color atro-ruber.

At first sight this *Andræa* may be distinguished from its congeners by its more robust appearance, and by the more striking character of its leaves being imbricated on all sides of the stem, and never in the least secund. The var. β is remarkable for its large size, as well as its paler colour and more distinct leaves. γ might without a careful examination of the leaves be almost taken for a distinct species, and differs from α and β in having the stems as well as branches peculiarly straight and erect, the latter of so equal an height that they form compact tufts, of which the surface is as even as if cut with an instrument.

Although *Andræa alpina* has been given as a native of several parts of the North of England and Wales, yet I am inclined to think it may be numbered among our *Musci rariores*, and that *A. rupestris* has been often mistaken for it. Thus much I can say, that most of the specimens under the name of *A. alpina*, from the last-mentioned places, that I have had an opportunity of seeing, have proved to be *A. rupestris*; and on Ingleborough, where it is said to have been gathered, Mr. Dalton and myself were only able to find *rupestris* and *Rothii*. In Scotland, indeed, upon

upon most of the high mountains, it seems to be not uncommon, and is even plentiful upon Ben Lawers, Ben-y-more, and Ben Nevis, but always upon the rocky summits, and even there of far less frequent occurrence than *A. rupestris* or *Rothii*. Mr. Turner has also received Irish specimens, gathered both by Mr. Templeton and Mr. Mackay.

2. Andræa *rupestris*.

A. caule ramoso, foliis oblongo-lanceolatis obtusiusculis apice falcatis enervibus subsecundis; perichætialibus erectis oblongis: marginibus involutis.

Jungermannia rupestris. *Linn. Fl. Suec.* 920. ed. ii. *p.* 402. *n.* 1045.* *Sp. Plant.* ii. *p.* 1601. *n.* 21. *Weber, Spic. Fl. Goet. p.* 154. *n.* 217. *Roth. Fl. Germ.* i. *p.* 485. *n.* 28. iii. *p.* 378. *n.* 14. (excl. Syn. Dill.)

Andræa rupestris. *Hedw. Sp. Musc. p.* 47. *t.* 7. *f.* 2. *Engl. Bot. t.* 1277. (excl. syn. Fl. Brit. et Dill.) *Mohr, Fl. Crypt. Germ. p.* 384. *t.* 11. *f.* 5, 6.

Hab. On the Welsh mountains, *Mr. Dillwyn* and *Rev. H. Davies*. Yorkshire, *Mr. Robson*. On the highland mountains of Scotland, upon dry and barren rocks, not uncommon.

Perennis. Æstate.

Caules cæspitosi, subunguiculares, erectiusculi, nunc simplices, nunc prope basin bifurci, segmentis plerumque indivisis, undique vestiti foliis laxè imbricatis, flavo-olivaceis, latè-lanceolatis,

* Linnæus's description, in the second edition of *Flora Suecica* more particularly, and in the *Species Plantarum*, of this plant seems best to accord with *A. Rothii*; but his own specimens in the Linnæan Herbarium prove this to be the plant he intended, unless, as is most probable, he confounded the two.

obtusis, apice curvatis, utplurimum secundis, concaviusculis, prorsùs enervibus, dorso punctis minutis elevatis longitudinalitèr striatis et quasi papillosis; *Perichætialia* reliquis longiora et pedicellum subæquantia, erecta, arctè imbricata, appressa, oblonga, vel oblongo-ovata, concava, obtusa, marginibus parùm involutis, flavescentia, longitudinalitèr striata; *Perigonialia* caulinorum similia, sed lætiùs flavescentia.

Fructificatio; *fœminea* terminalis; *Pedicellus* vix lineam longus, albus, succulentus, demum fuscescens, *Apophysi* terminatus oblongâ, angustâ, fuscâ; *Capsula* oblongo-ovata, basi alba atque diaphana, reliqua rufo-fusca, in quatuor valvas oblongas, ab apice ad infra medium, sed non ad basin attingentes, dehiscens; *Operculum* capsulæ pro ratione magnum, conicum, album, diaphanum, valvarum apicibus affixum: *Mascula* gemmiformis, terminalis; *Antheræ* 4 seu 5, subpedicellatæ, oblongo-cylindraceæ, effœtæ, albidæ, subpellucidæ; *Fila succulenta*, numerosa, lutescentia, filiformia, articulata, antheris sesquilongiora.

It will readily be seen, on looking at the above synonyms, how little the present plant has been either known or understood; and, indeed, it has very generally been confounded both with the preceding and the following species. This with respect to the latter is the more surprising, as two plants of the same genus can scarcely be more dissimilar in the structure and form of their leaves. The capsule of this *Andræa* has a striking peculiarity in its white semitransparent base, which is not dehiscent as in the other species, but is probably of a different texture from the rest of the capsule, as well as of a different colour; from which latter circumstance this part may be taken for a continuation of the apophysis; but *that* is situated just below it, and may be easily distinguished, on dissection, by its being filled with a pulpy substance only; whereas the white base to the capsule

capsule contains its portion of the seeds, besides the columella, which passes through its centre and is inserted into the apophysis.

Andræa rupestris is found in less alpine situations than the last-mentioned species. On dry rocks, which afford nourishment to the various species of *Gyrophoræ*, and where there seems to be scarcely a particle of vegetable mould, this little plant may not unfrequently be met with.

** *foliis uninervibus.*

3. Andræa *Rothii.*

A. caule simpliciusculo, foliis lanceolato-subulatis falcato-secundis uninervibus fragilibus; perichætialibus oblongis enervibus: margine involuto.

A. Rothii. *Mohr, Fl. Crypt. Germ. p.* 385. *t.* 11. *f.* 7, 8, 9.*
A. rupestris. *Smith, Fl. Brit.* 1178. *Turn. Musc. Hib. p.* 14.
Lichenastrum alpinum nigricans, foliis capillaceis, reflexis. *Dill. Hist. Musc. p.* 507. *t.* 73. 40

Hab. In montibus Arvoniæ, Snowdon and Glyder, *Dillenius.* Ireland, *Mr. D. Turner.* On the Yorkshire and Scotch mountains, frequent.
Perennis. Æstate.

Caules cæspitosi, fragiles, vix unguiculares, erecti, plerumque simplices, sed interdum ramosi, ramis subappressis, simpliciusculis, ubique vestiti foliis densè imbricatis, e basi latiore lanceolatâ subulatis, falcatis, secundis, rigidis, nervo valido, basi

* *Engl. Bot. t.* 2162.

obsole-

obsoletiore, ad apicem percurrente instructis, nigro-viridibus, siccitate omninò nigris, sub lente elegantissimè punctatis; *Perichætialia* reliquis breviora, pedicelli vix longitudinem excedentia, oblonga vel oblongo-ovata, *interiora* margine inflexo et prorsùs enervia, *exteriora* nervo obsoleto infra apicem evanescente percursa; *Perigonialia* e basi ovato-subrotundâ acuminata, concava, infernè obsoletè uninervia.

Fructificatio; fœminea terminalis; *Pedicellus* vix lineam longus, albus, demum fuscescens, desinens in apophysin exiguam, rotundatam, fuscam, capsulâ angustiorem; *Capsula* ovata, nigro-fusca, basi pellucida, in quatuor valvas angustas ad basin usque longitudinalitèr dehiscens; *Operculum* conicum, minutum, albescens: *Mascula* gemmiformis, terminalis; ex *Antheris* constans 3—5, ovato-cylindraceis, subpellucidis, pallidè fuscis; et *Filamentis succulentis* numerosis, filiformibus, articulatis, flavescentibus, antheris duplo longioribus.

The only botanist who appears to have well understood the three preceding species of *Andræa* was the late Dr. Mohr, who first described *A. Rothii* as distinct from *rupestris*, and gave figures of them all in his excellent *Flora Germanica*. *A. Rothii* is far from uncommon in the mountainous parts of the British isles, and is immediately distinguished by its very black colour and small size. It is unquestionably the plant intended by the name of *A. rupestris* in the *Muscologia Hibernica*, which caused Hedwig's figure of the true *A. rupestris* to be there referred to *A. alpina*, though its most striking character, the midrib of the leaves, is not noticed by Mr. Turner. In the neighbourhood of Bantry it is so abundant, that, according to Miss Hutchins, the mountains are black with it.

4. Andræa

4. Andræa *nivalis.*

A. caule ramoso, foliis laxè imbricatis lanceolatis subfalcatis secundis uninervibus; perichætialibus conformibus.

β fuscescens; foliis insignitèr falcatis fuscis.

Hab. Upon rocks on the summit of Ben Nevis, at the East end. *Perennis.* Æstate.

Caules erecti, densissimè cæspitosi, flexuosi, rubicundi, 3-unciales et ultrà, hi simplices, illi, quod sæpiùs accidit, bi-trifurci vel ramis aliquot sparsis brevibus instructi, ubique foliosi; *Folia* remotiuscula, angustè oblongo-lanceolata, acuminata, secunda, subfalcata, paululùm concava, sæpe plana, fusco-viridia, summa pallidiora, omnia minutissimè punctata, et nervo rubescente crassiusculo ad apicem usque attingente percursa; *Perichætialia* reliquorum similia; *Perigonialia* reliquis triplò breviora, ovato-subrotunda, brevitèr acuminata, concava, fuscescentia, nervo obscuro prope medium evanescente instructa.

Fructificatio; fœminea terminalis; *Pedicellus* sesquilinearis, foliorum longitudinem vix excedens, albo-virescens, basi parùm incrassatus et quasi bulbosus; *Apophysis* huic insidet minuta, oblonga, fusca, pedicello vix crassior; *Capsula* ovata, atro-fusca, in quatuor valvas angustas longitudinalitèr dehiscens; *Operculum* minutum, fuscum, valvis adnatum: *Mascula* frequentissima, gemmiformis, terminalis; *Antheræ* 4 ad 6, oblongæ, subpedicellatæ, fuscescentes; *Fila succulenta* numerosa, flavescentia, articulata, antherarum longitudinem bis terve excedentia, filiformia, sursùm versus paululùm incrassata.

Var. β discrepat colore magis fuscescente nitoris omnino experte, foliis densioribus magisque falcatis.

This very distinct species of *Andræa* has hitherto, I believe, been

been observed only by Mr. Borrer and myself upon the rocky summit of Ben Nevis, a mountain scarcely to be equalled by any other in Great Britain for the richness and rarity of its vegetable productions, particularly in the order of *Musci*, and which, from its vast extent, must be as yet but partially explored by the Cryptogamic botanist.

A. nivalis produces capsules in the month of July, but sparingly, although the male fructification is to be found in plenty at that season, and is easily distinguishable from the rest of the plant by its paler colour Barren specimens, and especially the variety β, have very much the appearance at first sight, both in the mode of growth and colour, of Mr Dickson's *Jungermannia aduncа*, but the slightest examination of the leaves with a common pocket-lens will be sufficient at once to distinguish them. Its nearest affinity is with the preceding species, from which it may always be known by its far greater size and different colour, by the similarity of the perichætial leaves to the cauline ones, and by these latter, which are much broader and by no means subulate, so that the nerve is furnished on each side with a considerable portion of the leaf to the very apex, whereas in *A. Rothii* it occupies towards the apex almost the whole breadth of the leaf. The pedicellus too has a peculiarity that I have not observed in any other species, in its base where the barren pistilla are situated being incrassated into a sort of bulb.

Explanation of Tab. XXXI.

Fig. 1. Andræa *alpina.*

a. portion of a branch, magnified 6
b. leaf 5
c. exterior

c. exterior perichætial leaf 5
d. interior perigonial leaf 5
f. 2 antheræ and succulent filaments 1

Fig. 2. Andræa *rupestris.*

a. portion of a branch, magnified 6
b. c. leaves 5
d. perichætial leaf 5
e. perigonial leaf 5
f. 2 antheræ from which the pollen has been discharged, and 2 succulent filaments 1

Fig. 3. Andræa *Rothii.*

a. capsules, magnified 6
b. leaf 5
c. perichætial leaf 5
e. a single anther and succulent filament 1

Fig. 4. Andræa *nivalis.*

a. a. female plants
b. b. male ditto } natural size.
c. var. *β*
d. female plant, magnified 6
e. fully formed capsule with the torn calyptra, pedicellus and perichætial leaf 2
f. capsule after the discharge of the seeds 2
g. the columella with a few seeds adhering to it 2
h. seeds 1
i. portion of the calyptra 1
j. leaf

j. leaf 4
k. male head 6
l. exterior perigonial leaf 5
m. interior ditto 5
n. antheræ and succulent filaments 2
o. anther discharging the pollen 1
p. succulent filaments 1

Halesworth, Feb. 19th, 1810.

XXI. *Some*